

RIVERS AND FLOODS.

By Prof. H. C. FRANKENFIELD, in charge River and Flood Division.

During the first half of the week beginning Sunday, October 2, general low pressure prevailed over the interior of the country and a decided high area over the Atlantic States and the North Atlantic Ocean. Heavy rain set in over the lower Ohio Valley during the night of Monday, October 3, and continued until the night of Thursday, October 6. During October 5 and 6 the heavy rains extended northeastward into the upper Lake region, but were not excessive east of the State of Ohio. The greatest rainfall reported from river stations was 10.95 inches at Cairo, Ill., and 10.88 inches at Evansville, Ind., while between the two places as much as 15 inches was reported. As a whole, the rainfall was greatest over the watershed of the Wabash River, although above Evansville through the States of Indiana, Kentucky, and Ohio the fall ranged from 4 to 7 inches. The normal dry season and the antecedent low-water conditions operated to prevent a flood in the Ohio River, and the highest stage reported was 26.8 feet at Cairo, on October 11, 18.2 feet below the flood stage. At Evansville the highest stage reached was 25.8 feet. The northern tributaries of the Ohio River, however, and the interior rivers, generally, of the States of Ohio and western Kentucky soon responded to the unusual conditions and the resulting floods were widespread and destructive.

Damage to railroads, bridges, etc., was of the usual character and was very heavy, but the greatest losses were occasioned by the destruction of standing crops, especially of corn in the shock. The estimated losses were between \$3,000,000 and \$3,500,000. Detailed accounts of the floods will be found in another portion of this REVIEW.

Warnings were first issued on October 6, and thereafter until the waters began to subside. Flood stages were first reached during the night of October 6-7.

There were no other floods during the month.

Very low stages prevailed over the greater portion of the Arkansas River, and at Wichita, Kans., and Little Rock, Ark., the lowest stages of record were reached. At Wichita the lowest stage was 4.3 feet below zero from October 23 to 31, inclusive, and at Little Rock, zero on October 31, with a further fall indicated.

The recent completion of Dam No. 6, on the Cumberland River, about 90 miles from Nashville, marks an epoch in the history of the navigation of the Cumberland River. Lock No. 7 was also completed a short time ago, and the effect of the entire series of eight dams is the all-the-year maintenance of a stage of from 6 to 6.5 feet of water from Lock A, about 41 miles below Nashville, to a point just above Carthage, Tenn., a total distance of about 166 miles. A list of the locks and dams follows:

Designation.	Put in operation.	Distance from Nashville.
Lock A.....	November 24, 1904.	41.4 miles below.
Lock No. 1.....	November 26, 1904.	2.6 miles below.
Lock No. 2.....	October 9, 1907.....	9.0 miles above.
Lock No. 3.....	October 15, 1908.....	26.0 miles above.
Lock No. 4.....	November 17, 1909.....	44.8 miles above.
Lock No. 5.....	October 18, 1909.....	72.0 miles above.
Lock No. 6.....	October 21, 1910.....	89.6 miles above.
Lock No. 7.....	October 18, 1910.....	106.6 miles above (9.2 miles below Carthage).

Hydrographs for typical points on several principal rivers are shown on Chart I. The stations selected for charting are Keokuk, St. Louis, Memphis, Vicksburg, and New Orleans, on the Mississippi; Cincinnati and Cairo, on the Ohio; Nashville on the Cumberland; Johnsonville, on the Tennessee; Kansas City, on the Missouri; Little Rock, on the Arkansas; and Shreveport, on the Red.

SPECIAL PAPERS ON GENERAL METEOROLOGY.

RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

C. FITZHUGH TALMAN, Librarian.

The following have been selected from among the titles of books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Anonymous publications are indicated by a —.

Azores. Service météorologique.

Résumé d'observations. 1909. Lisbonne. 1910. 17p. ob. 4°.

Bologna. Osservatorio della R. università.

Osservazioni meteorologiche. 1909. Bologna. 1910. 31p. f°.

Bradtke, Franz.

Stehende Seespiegelschwankungen (Seiches) beobachtet am Lagower See und Tschetschsee in der Mark. Halle a/S. 1910. 92p. 8° (Inaug.-Diss.—Halle-Wittenberg.)

Briggs, Lyman J. & Belz, J. O.

Dry farming in relation to rainfall and evaporation. Washington. 1910. 71p. 8°. (U. S. Bureau of plant industry. bull. 188.)

Coimbra. Observatorio meteorológico.

Observações meteorológicas e magnéticas. 1909. Coimbra. 1910. viii, 157p. f°.

Colombo (Ceylon). Observatory.

Report. 1909. [Colombo.] [1910.] viii, 50p. f°.

Costanzo, G. & Negro, C.

Meteorologia agricola. Milano. 1911. xi, 200p. 24°.

Deluc, J[ean] Á[ndré].

Recherches sur les modifications de l'atmosphère, contenant l'histoire critique du baromètre, & du thermomètre, ... Nouvelle édition. Paris. 1784. 4v. 8°.

Gorczyński, Władisław.

Sur la valeur de la "constante solaire" d'après les mesures prises à Ursynów (Pologne) en été 1909. Varsovie. 1910. 8°. (Extr., C-r., Soc. sci. Varsovie, Cl. sci-math et nat., 3. Année, 1910, p. 130-145.)

O przebiegu rocznym i dziennym usłonecznienia w Krakowie. Sur la marche annuelle et diurne de la durée de l'insolation à Cracovie. [Résumé in French.] Warszawa. 1910. 8°. (Extr., C-r., Soc. sci. Varsovie, Cl. sci-math et nat., 3. Année, 1910, p. 162-178.)

Günther, Siegmund.

Ein Beitrag zur Vorgeschichte der modernen Gewitterkunde. München. 1910. 22p. 8°. (S-A., Sitzber. K. Bay. Akad. Wiss., Math.-phys. Kl., Jhrg. 1910, Abh. 4.)

Hands, Alfred.

Lightning and the churches. London. 2d. ed. 1910. 92p. 8°.

Harts, W. W.

Forestry and stream flow. (In Proc. eng. assoc. south, 1910, 21:20-46.)

International catalogue of scientific literature.

F. Meteorology including terrestrial magnetism. 7th. Annual issue, 1907. London. 1909. viii, 284p. 8°.

International council for the study of the sea.

Bulletin hydrographique pour l'année juillet 1908-juin 1909. Copenhagen. [1910.] v. p. f°.

Ninth international geographical congress.

Compte-rendu... publié... par Arthur de Claparède. Genève. 1909-1910. 2v. 8°.

Internationale Luftschiffahrts-Ausstellung (ILA).

Denkschrift der 1sten... zu Frankfurt a/M. Bd.I. Wissenschaftliche Vorträge. Berlin. 1910. [8], 293p. 4°.

Imperial academy of sciences of Saint Petersburg.

Protokoly zasjedanié vtorogo meteorologicheskago s'ezda pri Imperatorskoj akademii nauk, 11-17 iánvaria, 1909 g. [Protocol of the sessions of the 2d. meteorological congress under the imperial academy of sciences, January 11-17, 1909.] Sanktpeterburg. 1910. viii, 344p. 4°.

Japan. Central meteorological observatory.

Annual report, 1908, Pt. I. Tokio. 1910. 387p. 4°.

Jurva, Risto.

Över åskväder i Finland. 1905. Helsingfors. 1910. 168p. 8°. (Bidrag till Känndom af Finlands Natur och Folk. H. 68, No. 1.)

Lockyer, William J. S.

Southern hemisphere surface-air circulation: Being a study of the mean

- monthly pressure amplitudes, tracks of anticyclones and cyclones, and the meteorological records of several antarctic expeditions. London. 1910. iii, 109p. f°. (London. Solar physics observatory.)
- Madrid. Observatorio de Madrid.** Observaciones meteorológicas... 1902-1905. Madrid. 1910. xx, 611p. 8°.
- Prussia. Landesanstalt für Gewässerkunde.** Jahrbuch... 1906. Berlin. 1910. v. p. f°.
Same. 1907. Berlin. 1910. v. p. f°.
Same. Besondere Mitteilungen. Bd. 2, Hft. 2. Berlin. 1910. 41p. f°.
- Russia. [Hydrographic office.]** Sbornik gidro-meteorologicheskikh nabliudeniij... Vypusk 7. 1904, 1905, 1906 g. Sankt-Peterburg. 1909. xxxiv, 500p. 4°.
Same... Vypusk 8. 1907, 1908 g. Sankt-Peterburg. 1910. xxxi, 399p. 4°.
- St. Ignatius college. Meteorological observatory.** Annual report. v. 15. 1909. Cleveland. n. d. n. p. 8°.
- Sandström, J. W. & Helland-Hansen, B.** Ueber die Berechnung von Meeresströmungen. Bergen. 1903. 43p. 4°. (Rpt. Norwegian fishery- and marine-investigations. v. 2. 1902. No. 4.)
- Smith, F. C.** Relation of climate to the treatment of pulmonary tuberculosis. Washington. 1910. 17p. 8°. (U. S. Publ. health and Marine-hospital serv. P. H. bull. 35.)
- Société astronomique et météorologique de Port-au-Prince.** Bulletin annuel... Année 1909. Port-au-Prince. 1910. 3p. f°.
- Tiflis. Physikalisches Observatorium.** Beobachtungen... 1899. Tiflis. 1909. 230p. f°.
Same. 1900. Tiflis. 1909. 252p. f°.
Same. 1901. Tiflis. 1909. 162p. f°.
Same. 1902. Tiflis. 1909. 170p. f°.
Same. 1903. Tiflis. 1909. 170p. f°.
Same. 1904. Tiflis. 1909. 170p. f°.
- Tsukubasan. [Observatory]** Ergebnisse der meteorologische Beobachtungen, 1907. Tokio. 1910. 129p. f°.
- Venice. Ufficio idrografico.** Le bureau hydrographique du "Magistrato alle Acque" de Venise. Venezia. 1910. 15p. 4°.
- Yntema, Lambertus.** On the brightness of the sky and the total amount of starlight. An experimental study. Groningen. 1909. 62p. f°. (Inaug.-Diss. Groningen.)
- Zi-ka-wei. Observatoire magnétique et météorologique.** Bulletin des observations. T. 33, Année 1907. Fasc. A. Magnétisme terrestre. Shanghai. 1910. 77p. f°.
The storms of August 1910. Shanghai. 1910. 24p. 8°.

RECENT PAPERS BEARING ON METEOROLOGY AND SEISMOLOGY.

C. FITZUGH TALMAN, Librarian.

The subjoined titles have been selected from the contents of the periodicals and serials recently received in the Library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau. Unsigned articles are indicated by a —.

Electrical world. New York. v. 56. 1910.
—Daylight and dark-day charts at Milwaukee. p. 1184. (Nov. 17.)
—Lightning phenomena under investigation at University of Illinois. p. 1215. (Nov. 24.) [Note on experiments to devise better protection of buildings against lightning.]

Geographical society of Philadelphia. Bulletin. v. 8. October, 1910.
Van Cleef, Eugene. Climatic influences in the economic development of Australia. p. 1-26.

Wilson, Lucy L. W. Climate and man in Peru. II. p. 27-45.

Japan. Central meteorological observatory. Bulletin. Tokio. 1910.

Okada, T. On the bai-u or rainy season in Japan. p. 1-82.

Korea. Meteorological observatory. Scientific memoirs. Chemulpo. v. 1. 1910.
Mukasa, H. Die Organisation des Koreanischen meteorologischen Observatoriums. p. 1-16. [With list and map of stations, illustrations of weather and storm signals, and views of the central observatory.]

Hirata, T. Evaporation in Korea and south Manchuria. p. 1-21.

Wada, Y. Les pluviomètres du XV^e siècle. p. 1-4.

Nature. London. v. 85. 1910.

—Meteorological relationships. p. 55-56. (Nov. 10.) [Reviews certain investigations by H. H. Hildebrandsson and E. T. Quayle.]

Chree, C[harles]. Atmospheric electricity and rain. p. 80-81. (Nov. 17.)

- Scientific American. New York. v. 103. Nov. 19, 1910.**
—Earthlight. p. 394.
- Boyer, Jacques.** The new Dosne heliograph. p. 402-410. [Illustrated.]
- Scientific American supplement. New York. v. 70. 1910.**
Talman, C. Fitzhugh. The meteorological isograms. A rapidly growing family of curves descended from Alexander von Humboldt's "isotherms." p. 316-318. (Nov. 12.) [Illustrated.]
- Crouzon, —.** Physiological effects of altitude. A new field for investigation. p. 334. (Nov. 19.)
—Dew ponds. p. 346. (Nov. 26.)
- Scottish meteorological society. Journal. Edinburgh. v. 15. 1909.**
Carse, G. A. Atmospheric electricity. p. 143-149. [Sketch of methods and theories.]
- Bell, Herbert.** On the diurnal range of wind velocity at Blackford Hill observatory, Edinburgh. p. 149-154.
- Dudgeon, R. F.** Fifty years' rainfall at Cargen, near Dumfries. p. 155-157.
- Richardson, Ralph.** On the occurrence of great cold throughout Scotland during November and December, 1909, and January, 1910. p. 158-162.
- Fairgrieve, M. McCallum.** Research papers from the Meteorological office. p. 163-175.
—Anomalous readings of dry and wet thermometers. p. 177-179. [Suggests explanations of the wet-bulb reading higher than the dry.]
- Jamieson, T. F.** On the greatest frosts of the past sixty years [in Scotland]. p. 179-181.
- Symons's meteorological magazine. London. v. 45. November, 1910.**
- Mossman, R. C.** Meteorology at the international American scientific congress, Buenos Aires, July, 1910. p. 177-182. [Includes description of the Argentine meteorological service.]
—Casella's insulated rain gauge. p. 182-183.
—Heavy rainfall in Barbados. p. 186-187.
- United States. Weather bureau. Meteorological chart of the North Atlantic ocean. January, 1911.**
- Humphreys, W[illiam] Jackson.** Ocean currents—their relation to one another.
- Archives des sciences physiques et naturelles. Genève. Tome 30. 15 octobre 1910.**
- Drygalski, E. v.** La glaciation des mers. Les conditions de son développement et les faits observés. p. 356-378.
- 9. Congrès international de géographie. Compte rendu. Genève. Tome 2. 1910.**
- Rudolph, E[mil].** Die Beziehungen zwischen den tektonischen und seismischen Verhältnissen Ostasiens. p. 201-213.
- Hobbs, William Herbert.** A study of the damage to bridges during earthquakes. p. 214-219.
- Gerland, Georg.** Das seismische Verhalten des Atlantischen und des Pazifischen Ozeans. p. 220-234.
- Forel, François-A[phonse].** L'association internationale de sismologie. p. 246-249.
- Gautier, Raoul.** Température et précipitations au Grand Saint-Bernard. p. 348-352. [Abstract.]
- Markof, E. S.** Température de l'eau à la surface et fluctuations du niveau du Lac Gokteba; leur relation avec les variations séculaires du climat. p. 375-376.
- Voeikof, A[lexander Ivanovich].** Variations de la température annuelle et des pluies pendant de longues périodes. p. 377-379.
- Panebianco, Hypathia.** I tipi isobarici della valle del Po. p. 380-384.
- Maurer, J.** Nouvelle carte pluviométrique de la Suisse. p. 435-437. [Abstract.]
- Polis, [Peter.]** Luftdruckverteilung über dem Atlantischen Ozean und die Bedeutung der drahtlosen Telegraphie für die Erweiterung der täglichen Wetterkarten. p. 440-443.
- Hellmann, G[ustav].** Über die extremen Schwankungen des Regenfalls. p. 444-454.
- Platania, Gaetano.** Effetti magnetici del fulmine. p. 455-459.
- Kassner, Carl.** Meteorologische Erdgloben. p. 460-465.
- Gautier, Raoul.** Climatologie du Grand Saint-Bernard, température et précipitations. p. 466-468.
- Quervain, A[lfred] de.** Über eine neue Methode zur Erforschung der höheren atmosphärischen Strömungen nebst einigen an der Schweizer meteorologischen Zentralanstalt erhaltenen Resultaten. p. 469-472.
- Telles, Silva.** Le régionalisme climatologique. p. 473-478.
- France. Académie des sciences. Comptes rendus. Paris. Tome 151. 14 novembre 1910.**
- Bauer, Edmond, & Moulin, Marcel.** Le bleu du ciel et la constante d'Avogadro. p. 864-866.
- Nature. Paris. 38 année. 26 novembre 1910.**
Loisel, J. La foudre et les éclairs. p. 408-412.
- Annalen der Hydrographie und maritimen Meteorologie. Berlin. 38. Jahrgang. November 1910.**
—Die Witterung und die phänologische Erscheinungen zu Tsingtau in dem Jahre vom Dezember 1908 bis zum November 1909. p. 585-610.